

EC4630 FINAL PROJECT GUIDELINES FOR FALL 2003 (AY2004)

GRADING

Weighted as 60 percent of total course grade. Grading categories are:

1. Problem difficulty (15%)
2. Analytical content and accuracy (30%)
3. Apply existing computer code (20%)
4. Computer coding effort (15%)
5. Results and data analysis (10%)
6. Report content and quality (10%)

REQUIREMENTS

1. Individual work (no team projects).
2. Topics may be related to thesis work, but not simply extracted from it.
3. Original computer codes must include a program listing and check cases (to verify that it is working). Projects that use canned codes must submit representative outputs.
4. Written up “homework style” is acceptable. That is mostly equations and sketches with text to describe solution steps. Write-ups must be coherent and legible and contain sufficient detail so that a technical person not familiar with the problem can understand what you are doing. You should comment on the results and explain why they make sense.
5. **Projects are due the end of finals week (tentative).**

SAMPLE TOPICS

- Compute the RCS of a specific antenna
- Compare prediction methods for a target (e.g., PO vs. MM vs. GTD vs FEM, etc.)
- Use RCSBSC, PATCH, XPATCH or HFSS, or Microwave Studio to compute the RCS of a complex shape such as an aircraft, missile, or projectile
- Take a relevant technical paper and apply the results to a problem of interest (Note: do not simply summarize the paper)
- Calculate the equivalent surface impedance of a target and compute its RCS
- Examine the treatment of bodies using resonant or non-resonant absorbers
- Use active or passive cancellation to reduce the RCS of a simple target
- Examine the effect of imperfections on the RCS of a target (gaps, cracks, and joints)
- Compare the RCS of targets with and without treatment to reduce RCS
- Scattering from a periodic surface or periodic discrete scatterers (for example, rivet patterns or “sagging skin”)
- Edge contributions to scattering using GTD or PTD
- Radar system performance against stealth targets using ALARM or some other simulation program
- Examine tradeoffs between lowering RCS and employing jamming, chaff or other EW techniques